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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DENIS REIBEL,
DELPHINE GUIGNER,
GEORGES RIBOULET, ROBERT GROTEN,
and ULRICH JAHN

Appeal 2008-3620
Application 10/730,795
Technology Center 1700

Decided: October 29, 2008

Before EDWARD C. KIMLIN, CHUNG K. PAK, and
CATHERINE Q. TIMM, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1-13. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

I. BACKGROUND

The invention relates to a method of manufacturing a fabric having at least partially split yarns, fibers, or filaments (Spec. ¶ 2). According to the Specification, it was known in the art to manufacture fibers by spinning filaments containing two polymers and splitting the filaments along the phase boundaries of the polymers to divide them into smaller elementary filaments (Spec. ¶ 3). It was also known in the art to form fabrics using the split filaments (Spec. ¶ 3). Appellants' invention is directed to the addition of a compressing step to the process of forming the fabric (Spec. ¶ 5). Claim 1 is illustrative:

1. A method for manufacturing a fabric from yarns, fibers or filaments, including first elementary filaments of a first polymer and second elementary filaments of a second polymer, the method comprising:

receiving the yarns, fibers or filaments, from a common spinneret;

forming the yarns, fibers or filaments into a single first fabric;

compressing the first fabric to a density of at least 10% of a density of the first polymer, the compressing being performed at a temperature between a glass transition temperature and a melting temperature of the first polymer; and

subsequently applying a further mechanical force so as to cause an at least partial splitting of the yarns, fibers or filaments into the first and second elementary filaments.

On review is the Examiner's rejection of claims 1-13 under 35 U.S.C. § 103(a) as unpatentable over Talley (US 6,767,498 B1 issued Jul. 27, 2004

to Talley, Jr. et al.) in combination with Kato (US 4,908,176 issued Mar. 13, 1990).[1]

Appellants direct their arguments to claims 1, 4, 5, and 10 (Br. 8-10). Therefore, we limit our review to those claims, the other claims standing or falling with the claim from which they depend.

II. DISCUSSION

Claim 1

The Examiner finds that Talley teaches the claimed process except that Talley does not explicitly teach compressing a fabric to a density of at least 10% of a density of a first polymer as claimed (Ans. 5). The Examiner further finds that Kato teaches a process of making fabric including compressing the fabric to achieve an apparent density of 0.15 to 0.5 gram/cm^3. The Examiner concludes that compressing Talley's fabric to a density of at least 10% of a density of a first polymer would have been obvious to one of ordinary skill in the art at the time of the invention "principally in order to ensure bonding of the yarns, fibers or filaments used to make the fabric, and to manufacture a fabric having sufficient stiffness and elasticity." (Ans. 5-6.)

Appellants contend that "Kato does not show 'compressing the first fabric to a density of at least 10% of a density of the first polymer, the compressing being performed at a temperature between a glass transition temperature and a melting temperature of the first polymer' as in claim 1." (Br. 9.). Appellants also submit "that it would not have been obvious to one

[1] The Examiner has withdrawn rejections over Wagner and Dugan in combination with Kato (Ans. 3).

of skill in the art to have provided any compressing step in view of Talley, Jr. or Kato *prior* to the applying step as recited in claim 1," and "the claimed amount of compression is not disclosed in Kato or Talley." (Br. 10.)

The issue on appeal is: did Appellants identify reversible error in the Examiner's rejection of claim 1? The issue turns on whether the prior art would have suggested to one of ordinary skill in the art compressing the fabric of Talley as claimed.

Based on the proper application of the current law of obviousness to the essential facts, we answer this question in the negative.

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.").

"[A] prior art reference must be 'considered together with the knowledge of one of ordinary skill in the pertinent art.'" *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). For this reason, we "need not seek out precise teachings directed to the specific subject matter of the challenged

claim, for a court [or Board] can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 127 S. Ct. at 1741. After all, in an obviousness assessment, skill is presumed on the part of the artisan, rather than the lack thereof. *In re Sovish,* 769 F.2d 738, 743 (Fed. Cir. 1985).

With the above law in mind, we determine that the following enumerated Findings of Fact (FF) are of particular relevance to the disposition of the issue of obviousness in this case:

1. Talley describes spinning thermally splittable filaments or fibers formed of elastomeric components (e.g., polyurethane) and non-elastomeric components (e.g., polypropylene) (Talley, col. 3, ll. 27-29 and ll. 49-52).
2. In some embodiments, Talley teaches forming nonwoven fabrics using the non-split multicomponent filaments and splitting either during, or after, forming the nonwoven (Talley, col. 14, ll. 29-57).
3. The nonwoven can be formed by a number of different processes (Talley, col. 14, ll. 20-57) and, regardless of the nonwoven web formation process used, the fibers of the nonwoven are generally bonded together to form a coherently unitary nonwoven fabric (Talley, col. 14, ll. 58-60).
4. The nonwoven can be bonded by any method known in the art including thermal bonding (Talley, col. 14, ll. 60-62).
5. "In thermal bonding, heat and/or pressure are applied to the fiber web or nonwoven fabric to increase its strength. Two common methods of thermal bonding are through air heating, used to

produce low-density fabrics, and calendaring, which produces strong, low-loft fabrics." (Talley, col. 14, l. 66 to col. 15, l. 2.)

6. In one embodiment, Talley describes thermally bonding to simultaneously form the coherent nonwoven and split the filaments (Talley, col. 15, ll. 6-12).
7. Talley describes thermally bonding using known techniques including a method of directing a nonwoven web of polyurethane/polypropylene multicomponent fibers through the nip of cooperating bonding rolls (e.g., point bonding rolls, helical bonding rolls, or the like) heated to about 120°C to about 150°C and set to a pressure of about 300 pli to about 1000 pli (Talley, col. 15, ll. 14-24).
8. Talley also suggests adding a subsequent step of mechanical working if complete splitting is not achieved via the thermal treatment (Talley, col. 16, ll. 60-64).
9. Compressing a heated nonwoven web such that bonding occurs increases the density of the resulting nonwoven fabric (*see*, e.g., Kato, col. 2, ll. 10-13; col. 4, ll. 1-11; Examples; Table 1).
10. Polypropylene has a melting point of 164°C (Kato, col. 4, l. 51).

The above Findings of Fact establish that Talley would have suggested to one of ordinary skill in the art a process of forming a nonwoven web from splittable filaments or fibers (FF 1), applying heat and pressure by, for instance, calendaring to thermally bond and split the fiber (compressing at elevated temperature) (FF 2-6), and subsequently mechanically working to achieve complete splitting (FF 8). Talley, therefore, suggests a process

including steps of receiving, forming, compressing, and subsequently applying a further mechanical force; the general steps of claim 1.

Talley also teaches the general conditions of compressing including compressing at elevated temperatures and pressures (FF 7). These are the types of general conditions those of ordinary skill in the art would have routinely optimized. *See In re Aller*, 220 F.2d 454, 456 (CCPA 1955) ("Normally, it is to be expected that a change in temperature, or in concentration, or both, would be an unpatentable modification. . . . where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."). In this regard, one of ordinary skill in the art would have performed routine experimentation to obtain temperatures adequate to thermally bond the nonwoven and thermally split the fibers. There is no evidence here, nor even any argument, that the temperatures suggested by Talley would be outside Appellants' range.[2] Moreover, Talley provides evidence that the temperatures selected would be between a glass transition temperature and melting temperature of one of the polymers as claimed. Talley suggests using elevated temperatures (about 120°C to about 150°C) which, while elevated, are below the melting point of polypropylene (m.p. 164°C) for fibers including polypropylene (FF 7, 10).

Turning to the question of whether Talley suggests compressing to a density of at least 10% of a density of one of the polymers, there can be no real question that compressing under heat and pressure to bond nonwoven fabric was known to increase the density of the fabric. Talley recognizes

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[2] Appellants' arguments, in regard to the temperature limitation, focus only on what Kato teaches (Br. 9).

that applying no pressure will result in a high loft (low density) nonwoven while applying pressure through calendaring results in a low-loft (higher density) nonwoven (FF 5). Kato also shows the density increase (FF 9). The amount of compressing, and therefore, the amount of density increase, would have been a routine matter within the skill of the ordinary artisan of optimizing the heat and pressure to obtain the amount of loft and strength desired in the product nonwoven.

While we agree with Appellants (and the Examiner) that Talley does not *specifically* disclose that Talley's step of compressing results in a density of at least 10% of a density of the first polymer, we cannot say the lack of an express disclosure is an appropriate basis for concluding the Examiner reversibly erred. Instead, the evidence as a whole supports a conclusion of obviousness such that the burden is shifted to Appellants to show that their range is critical to obtain some unexpected result. *See In re Boesch*, 617 F.2d 272, 276 (CCPA 1980); *See also In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990); *Aller*, 220 F.2d at 456. Appellants present no convincing evidence of unexpected results on this record.

Appellants have not demonstrated that the Examiner reversibly erred in determining that compressing the fabric of Talley at a temperature within the claimed range to a density of at least 10% of the density of one of the polymers before applying a mechanical force to cause splitting of the fibers or filaments would have been obvious in view of the teachings of Talley and Kato.

Claim 4

Claim 4 is dependent on claim 1 and requires that compressing be performed to a density of at least 15% of the density of the first polymer.

Appellants contend that there is no teaching or disclosure in Talley or Kato that compressing is performed at the level claimed. For the reasons presented above for claim 1, we find this argument unpersuasive.

Claim 5

Claim 5 is dependent on claim 1 and further requires compressing be performed using a roll calendar.

Appellants contend that there is no teaching or disclosure in Talley or Kato of using a roll calender (Br. 10). Talley's teaching of calendaring (FF 5) is a fair suggestion of using a roll calender, therefore, we do not find this argument persuasive.

Claim 10

Claim 10 is dependent on claim 1 and further requires that the first and second elementary filaments be micro-elementary filaments and the first and second polymers be compatible polymer pairs.

Appellants contend that there is no teaching or disclosure in Talley or Kato meeting the limitations of this claim (Br. 10).

The following additional Findings of Fact (FF) are relevant to the consideration of Appellants' argument:

11. The Specification lists "polymers which are compatible among themselves" and "polymers which are incompatible among themselves," but does not provide any definition for "compatible polymer pairs." (Spec. ¶ 11 and Spec. in general.)

12. Talley describes selecting the elastomeric and non-elastomeric components so they have sufficient mutual adhesion to allow the formation of a unitary multicomponent fiber, but low enough to allow the components to split when thermally treated and

articulates a preference for polymer pairs having a difference in solubility parameters of at least about 1.2 $(J/cm^3)^{1/2}$ (Talley, col. 3, ll. 29-50).

13. It was known to form fabrics produced from spun mutually compatible polymers split by a splitting treatment (Spec. ¶ 3).

As a first matter, there can be no real dispute that Talley teaches splitting the filaments to form microfilaments (FF 1 and 2).

With respect to the "compatible polymer pairs" requirement of the claim, Appellants provide no definition in their Specification, nor any other evidence of what one of ordinary skill in the art would understand "compatible polymer pairs" to mean (FF 11). In light of this fact, "Appellants' bare assertion that neither Talley nor Kato teach the limitations of claim 10 is insufficient in view of the fact that Talley discloses using polymer pairs having particular levels of mutual adhesion that would appear to meet the requirements of the claim as broadly but reasonably interpreted (FF 12). Moreover, as acknowledged in the Specification, it was known in the art to select mutually compatible polymers for use in forming fabrics of split fibers (FF 13).

Appellants have not demonstrated that the Examiner reversibly erred in rejecting claim 10 as obvious over the combination of Talley and Kato.

III. CONCLUSION

We sustain the rejection of claims 1-13 under 35 U.S.C. § 103(a) as unpatentable over Talley in combination with Kato.

IV. DECISION

The decision of the Examiner is affirmed.

V. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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